Metal Science Journal

VOLUME 2

1968

EDITOR

J. S. BRISTOW, B.Sc., F.I.M.

The right of publication and of translation is reserved. The Trust is not responsible for the statements made or for the opinions expressed in the following pages.

Published by

THE METALS AND METALLURGY TRUST

of the Institute of Metals and the Institution of Metallurgists

17 Belgrave Square, London, S.W.1

in association with the Iron and Steel Institute

Contents

		Page
MS 49	**The Effect of Prestrain on Crack Propagation in Tungsten Single Crystals.** By P. Beardmore and D. Hull	1
MS 50	**The Kinetics of Alloy Carbide Formation in Ferrite.** By P. Wilkes	8
MS 51	**The Stacking-Fault Energy of Some Nickel–Cobalt Alloys.** By B. E. P. Beeston, I. L. Dillamore, and R. E. Smallman	12
MS 52	**Accelerated Spheroidization of Pearlite.** By E. A. Chojnowski and W. J. McG. Tegart	14
MS 53	**" Pure " Grain-Boundary Sliding in Zinc Bicrystals.** By C. A. P. Horton, N. B. W. Thompson, and C. J. Beevers	19
MS 54	**An Electron-Microscope Investigation of the Lamellar Al–$CuAl_2$ Eutectic.** By G. C. Weatherly	25
MS 55	**Grain-Boundary Migration and Cavitation during Fatigue.** By H. D. Williams and C. W. Corti	28
MS 56	**Transient Damping in Equiaxed and Irregular Ferrite.** By I. F. Hughes and B. L. Daniell	32
MS 57	**A Study of the Structure of Martensite by Internal-Friction Measurements.** By J. N. McGrath and R. Rawlings	37
MS 58	**Mechanism of Energy Dissipation in High-Damping-Capacity Manganese–Copper Alloys.** By D. Birchon, D. E. Bromley, and D. Healey	41
MS 59	**The Volume and Grain-Boundary Diffusion of Iron in 20 Cr/25 Ni/Nb Stainless Steel.** By A. F. Smith and G. B. Gibbs	47
MS 60	**The Mechanism of Cavity Growth in Copper during High-Temperature Fatigue.** By A. Gittins	51
MS 61	**An Investigation of Carbide Precipitation in Iron.** By E. W. Langer	59
MS 62	**Grain-Boundary Hardening in Iron and Iron Alloys.** By M. Braunović, C. W. Haworth, and R. T. Weiner	67
MS 63	**An Analysis of Bubble Growth in Materials Supersaturated with Inert Gas.** By M. V. Speight	73
MS 64	**Role of Cobalt in the Marage-Type Alloy Matrix.** By B. R. Banerjee, J. J. Hauser, and J. M. Capenos	76
MS 65	**The Influence of Ultrasound on the Kinetics of Precipitation-Hardening in a Cu–Be Alloy.** By G. A. Hayes and J. C. Shyne	81
MS 66	**The Effect of Deformation on the Resistivity Anomaly in Al–Cu–Cd Alloys.** By B. Noble and C. H. Thornton	86
MS 67	**The Strength of Soldered Joints.** By J. R. Griffiths and J. A. Charles	89
MS 68	**The Kinetics of Migration of Impurities to Small Dislocation Loops.** By R. Bullough, J. T. Stanley, and J. M. Williams	93
MS 69	**Yielding and Work-Hardening in Ni–ThO_2 Alloys.** By D. W. Ashall and P. E. Evans	96
MS 70	**Effect of Oxygen on " Stage III " Annealing in Neutron-Irradiated Niobium.** By J. M. Williams, W. E. Brundage, and J. T. Stanley	100
MS 71	**Interphase Precipitation in Iron Alloys.** By A. T. Davenport, F. G. Berry, and R. W. K. Honeycombe	104
MS 72	**An Assessment of Void Population from Density Measurements after Creep.** By R. P. Skelton	106
MS 73	**Changes Produced by Deformation in Grains and Grain Boundaries of Nickel.** By T. L. Lin and D. McLean	108
MS 74	**The Effect of Long-Range Order on the High-Temperature Fatigue Behaviour of Cu_3Au.** By A. Gittins	114
MS 75	**Precipitation in Aluminium–Copper Alloys Containing Additions of Indium and Tin.** By B. Noble	117
MS 76	**Manganese–Copper Alloys of High Damping Capacity.** By R. J. Goodwin	121
MS 77	**The Mechanism of Damping in Manganese–Copper Alloys.** By J. A. Hedley	129
MS 78	**The Mechanical Behaviour of the Intermediate Phase NiAl.** By R. T. Pascoe and C. W. A. Newey	138
MS 79	**The Fatigue of a Magnesium–Zirconium Alloy at High Temperature.** By R. P. Skelton	144
MS 80	**Influence of Cooling Rate and Composition on Intergranular Fracture of Cast Steel.** By N. E. Hannerz	148
MS 81	**Activation Energy for Isothermal Transformation to Martensite.** By A. R. Entwisle	153
MS 82	**Interfacial Energy of Dislocation and of Coherent Interphase Boundaries.** By H. I. Aaronson, J. B. Clark, and C. Laird	155
MS 83	**Crack Branching in Strong Metals.** By S. R. Anthony and J. Congleton	158
MS 84	**Crystal Rotations under Conditions of Imposed Strain and the Influence of Twinning and Cross-Slip.** By I. L. Dillamore, E. Butler, and D. Green	161
MS 85	**The Strain-Dependence of Density Changes during Creep.** By P. Bowring, P. W. Davies, and B. Wilshire	168
MS 86	**Effect of Carbon and Oxygen on the Fracture of Iron.** By Ryukichi Honda and Hidetake Taga	172
MS 87	**The Annealing of Voids in Quenched Aluminium and a Determination of the Surface Energy.** By K. H. Westmacott, R. E. Smallman, and P. S. Dobson	177
MS 88	**The Effect of " Solute " Interchange on the Martensitic Transformation Occurring in the 50 At.-% Au–Cd Alloy.** By M. E. Brookes and R. W. Smith	181
MS 89	**Stress Relaxation in Single Crystals of Copper and Alpha-Brasses.** By P. Feltham and C. J. Spears	183
MS 90	**The Effect of Hydrogen on the Plastic Deformation of Nickel Single Crystals.** By A. H. Windle and G. C. Smith	187
MS 91	**On the Kinetics of Precipitate Dissolution.** By H. B. Aaron	192
MS 92	**Instrumented Impact Testing of Low-Carbon Steels.** By E. A. Almond and J. D. Embury	194
MS 93	**Creep Mechanisms in Niobium-Stabilized Austenitic Steels.** By B. Russell, R. K. Ham, J. M. Silcock, and G. Willoughby	201
MS 94	**The Creep Behaviour of a 1% Cr–Mo–V Rotor Steel.** By J. Myers, G. Willoughby, and R. K. Ham	209
	Appendix: The Effect of Particle Size upon the Solute Spacing. By J. Barford	214
MS 95	**Growth of a Crack under Cyclic Loading in Plane Strain.** By W. S. Blackburn	214
MS 96	**Influence of Environment on Intergranular Cavitation.** By E. C. Scaife and P. L. James	217
MS 97	**The Grain-Size-Dependence of Flow Stress in Mild Steel.** By J. T. Evans and R. Rawlings	221
MS 98	**The Production of Vacancies by Oxidation in Zinc and Magnesium.** By R. Hales, P. S. Dobson, and R. E. Smallman	224
MS 99	**The Influence of a Second Phase on the Yielding Characteristics of Zirconium.** By D. V. Edmonds and C. J. Beevers	228
MS100	**Influence of Phosphorus on the Nucleation of $M_{23}C_6$ Carbides in Austenitic Stainless Steels.** By F. H. Froes, M. G. H. Wells, and B. R. Banerjee	232
MS101	**High-Strain Fatigue-Crack Nucleation in an Austenitic Steel at Elevated Temperatures.** By B. J. R. Hodgson	235
MS102	**A Determination of the Punching Stress at the Interface of Particles during Rapid Quenching.** By G. C. Weatherly	237

© The Metals and Metallurgy Trust. 1968